A NEARLY COMPLETE CARAPACE OF A FOSSIL TURTLE, AMYDA VIRGINIANA (CLARK)

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The species *Amyda virginiana* was first described under the name *Trionyx virginianus* by Dr. William Bullock Clark in 1895 from fragments found at Aquia Creek, Va., in Eocene deposits of the Aquia Creek stage. On a recent trip to this same locality a nearly complete carapace referable to this species was obtained; and since this is, so far as can be ascertained, the most complete specimen of this large fossil turtle yet discovered it seems worthy of description.

The type fragments of the species were described by Clark as follows:

> Fragments of costals with tuberculated surfaces characteristic of the genus *Trionyx*. The longitudinal ridges are prominent, at times irregular and inosculate; relatively remote and separated by intervals about twice their width, generally entirely disappear near the margins of the plates.
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> A number of fragments of the plates of this large species were found in the vicinity of Aquia Creek, Va. This species shows some points of similarity with *T. cariosus* (Cope), from the Eocene of New Mexico, but is undoubtedly a different form.
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> *Dimensions.*—Length of largest fragment, 130mm.; width, 45mm.; thickness, 18mm.

Hay, in his Fossil Turtles of North America, gives more detailed descriptions and measurements of the 2-type fragments which, he believes, indicate a possibility that the two represent distinct species. This idea is based upon the fact that the sculpturing of the two fragments differs. The first fragment (the distal portion of a costal) (pl. 2, center) shows rather regular sculpturing, which consists of ridges and grooves, five of which are found in a line 22 mm. long. The sculpturing of the second fragment (the proximal portion of a costal) (pl. 2, lower) is more irregular and the pits are somewhat larger, five being contained in a line 25 mm. long. Moreover, Hay notes resemblances to *Amyda pennata* (Cope) of the Eocene of New Jersey, although he does not seem to believe that the two are synonymous. However, it is clear that the position and even the authenticity of this little-known species is much in question, and it is

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believed that the information obtained from the specimen here described will be of advantage in clearing up these points.

The present specimen (Cat. No. 11944, U.S.N.M.) consists of a carapace which is complete, except for the distal portions of the fourth, fifth, sixth, and seventh costals of the left side and small portions of the neurals. The carapace is broad, rounded in front, and somewhat truncate behind. At the free margins of the costals the upper layers of bone project somewhat beyond the lower layers, causing a longitudinal grooving of the carapace; beyond this the margins drop off gently to a thin edge. This was an exceedingly large turtle; the length of the carapace measured in a straight line is 735 mm., its greatest width 640 mm., not including the extension of the ribs beyond the margin of the shell. It is composed of a nuchal plate, 7 neurals, and 8 pairs of costals, the 2 posterior pairs meeting in the mid line.

The nuchal measures 380 mm. across and 87 mm. in an anteroposterior direction in the mid line, narrowing toward the outer ends. It is 27 mm. thick in the central portions and tapers off to a thin edge at the margins. Little ornamentation is apparent on this bone.

The measurements of the costals of the right side (where all are complete) are given in the following table:

Costal No.	Length	Width at center	Greatest thickness	Least thickness
	Mm.	*Mm.*	*Mm.*	*Mm.*
1	256	104	24	9
2	272	98	19	11
3	298	80	21	10
4	285	82	18	11
5	273	89	17	12
6	223	97	17	10
7	186	60	15	11
8	95	67	14	12

The ribs project beyond the margins of the carapace for some distance; the best preserved one, that of the second costal of the left side, extends out 92 mm. The lengths in the above table are taken only to the border of the costal, not out onto the projecting rib. Decided ridges are produced on the under sides of the costals by the ribs, which are in most cases nearer the anterior borders of the costals than the posterior borders. These ridges are plainly seen on Plate 1, left, which gives a ventral view of the entire specimen.

The sculpture corresponds closely with Hay's description for the type fragments. It consists of ridges and grooves running at right

angles to the sutures, the grooves sometimes broken up into pits by cross-ridges. In the best-preserved portions of the carapace this sculpturing is continued quite to the beveled margin of the shell. The width of ridges and grooves is variable, being in general greater toward the posterior end. Thus on the first costal plate five ridges and five grooves are contained in a line 18 mm. long; on the fourth costal the same number is contained in a line 22 mm. long; and on the eighth costal a line 28 mm. long is required. Moreover, the ridges run more irregularly and are more broken up on the anterior costals than on the posterior ones; and in all the costals the sculpturing is in general much more regular toward the distal ends. Plate 2, upper, shows the sculpturing on a large fragment from the distal end of the fifth costal of the right side. The ridges and pits on the neurals are extremely irregular in arrangement, producing a reticulate appearance. These facts indicate that the type fragments do belong to a single species, the difference in sculpturing described by Hay being attributable to the differences normally present between distal and proximal portions of the plates.

Moreover, little doubt remains as to the authenticity of the species. Hay's description of *Amyda* (*Trionyx*) *cariosa* (Cope) shows that it differs considerably not only in length and thickness but also in the sculpturing, for in *Amyda cariosa* the ornamentation consists chiefly of irregularly arranged pits, whereas in *Amyda virginianus* long longitudinal grooves predominate. The chief difference between *Amyda* (*Trionyx*) *pennata* (Cope) and the specimen under consideration is, as Hay remarks, that in the former the pits "are arranged in rows that run from the sutural edges toward the middle of the bone and at the same time toward the distal end." This is quite different from the condition in *Amyda virginianus*, where the ridges show no tendency to run toward the distal ends of the bone. Moreover, the fragments of *Amyda pennata* indicate that it was a much smaller turtle than was the one represented by the present specimen. However, the known fragments of *Amyda pennata* are so small and so few that it is impossible to clear up this point with absolute finality, although evidence thus far available seems to indicate that this species also is distinct from *Amyda virginianus.*

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EXPLANATION OF PLATES

PLATE 1

LEFT: Ventral view of the carapace described above, × ⅛.
RIGHT: Dorsal view, × ⅛. A foot rule is shown at the side.

PLATE 2

UPPER: A fragment forming the distal end of the fifth costal of the right side to show the sculpturing, × ½.
CENTER: One of the type specimens. Distal portion of a costal plate, × 1. Museum Wagner Free Institute of Science, Philadelphia.
LOWER: Type specimen. Proximal portion of a costal plate, × 1. Wagner Free Institute of Science, Philadelphia.

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